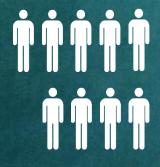


global food 40 years 8,000 years







x2=18

we need more from less

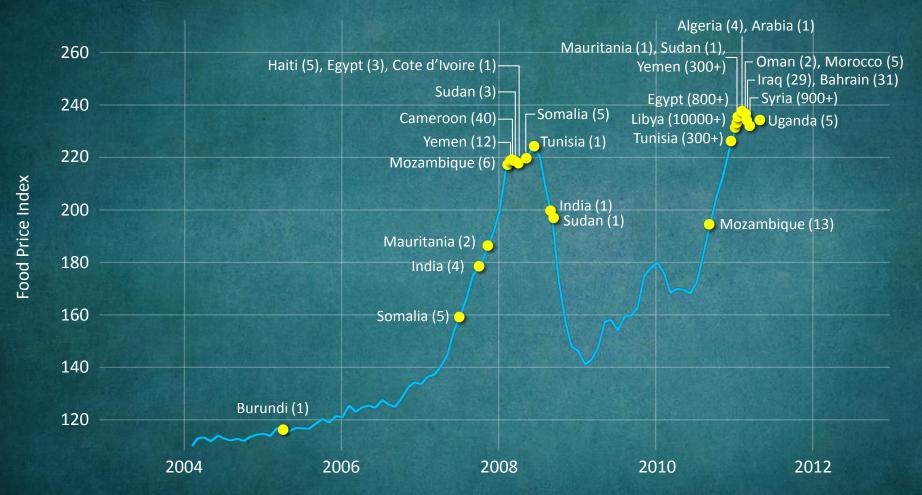
The China phenomenon

	Population at start of growth period	Years to double GDP per capita ¹
Britain (1700-1855)	9M	155
US (1820-1873)	10M	53
China (1983-1995)	1,023M	12
India (1989-2006)	822M	17

China doubling of GDP was 12x the speed of Britain during the Industrial Revolution at 100x the scale

400 million lifted out of poverty

Food prices and social unrest – 2004-2012



food production

is the biggest threat













the issue isn't what to think

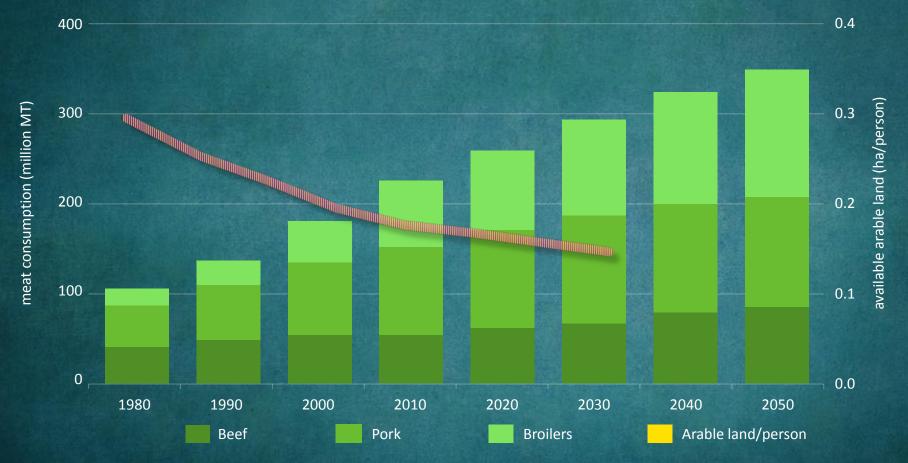
it's how to think



shift from maximizing one variable...

...to optimizing the key ones

World beef, pork and poultry consumption: 1980-2050

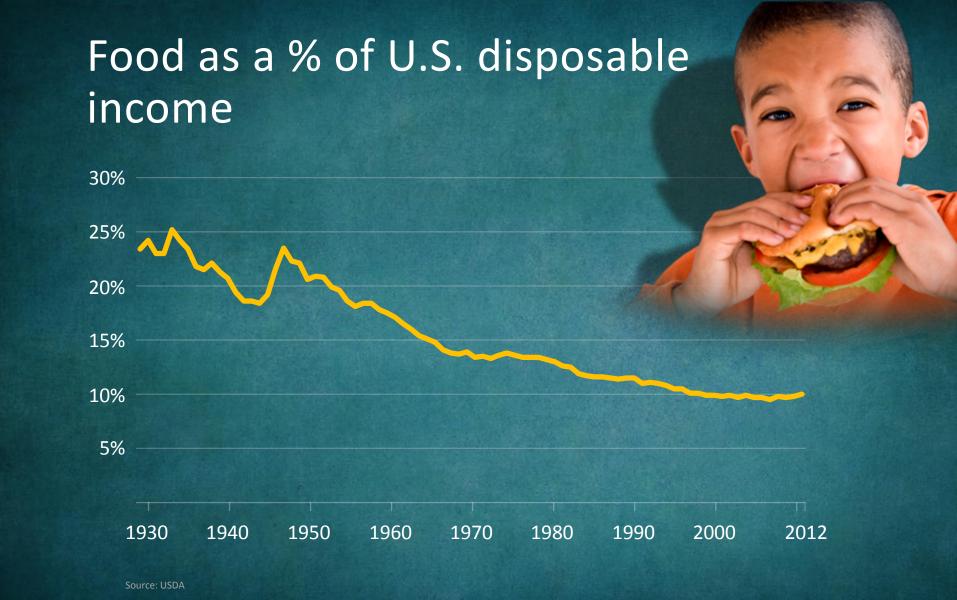


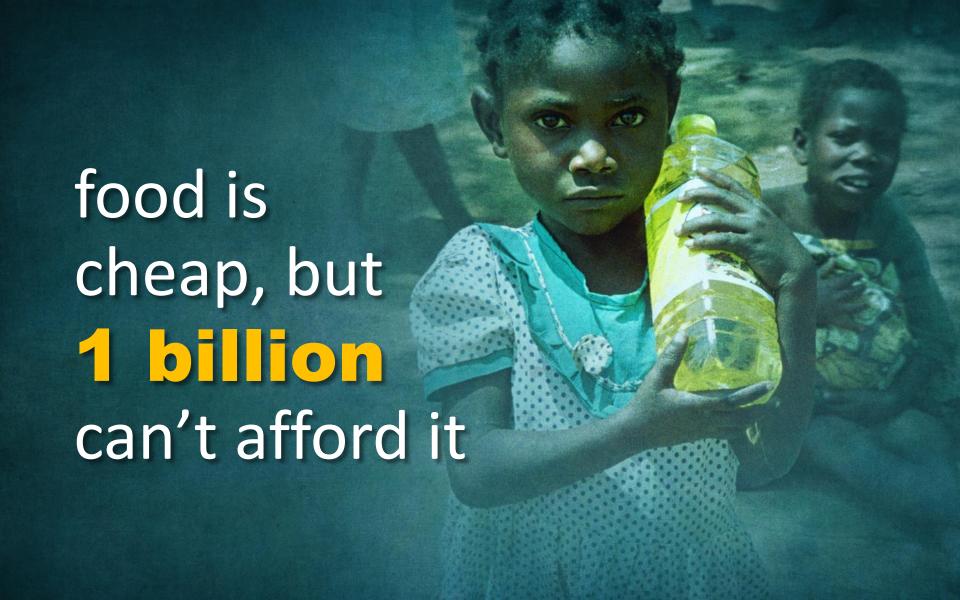






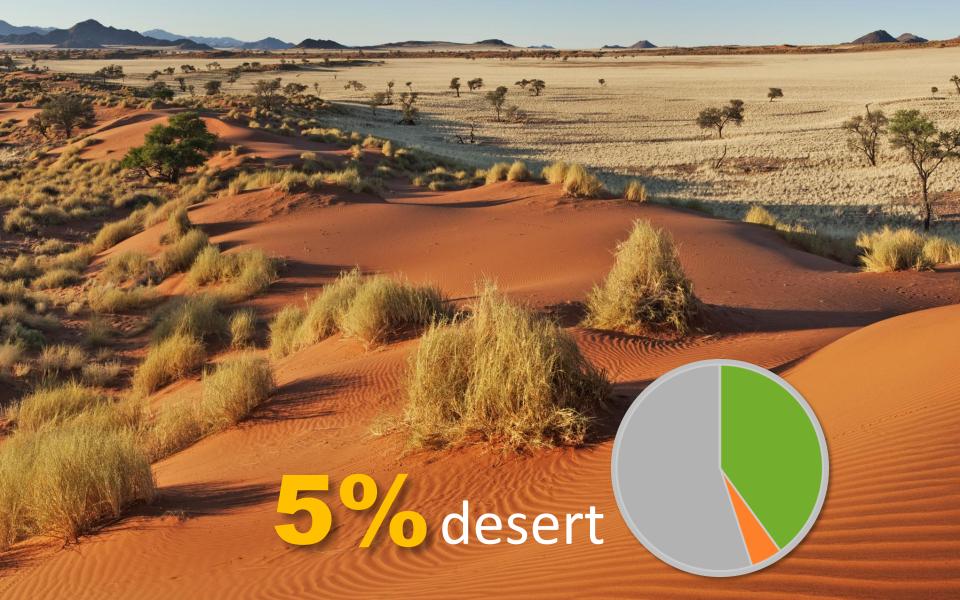






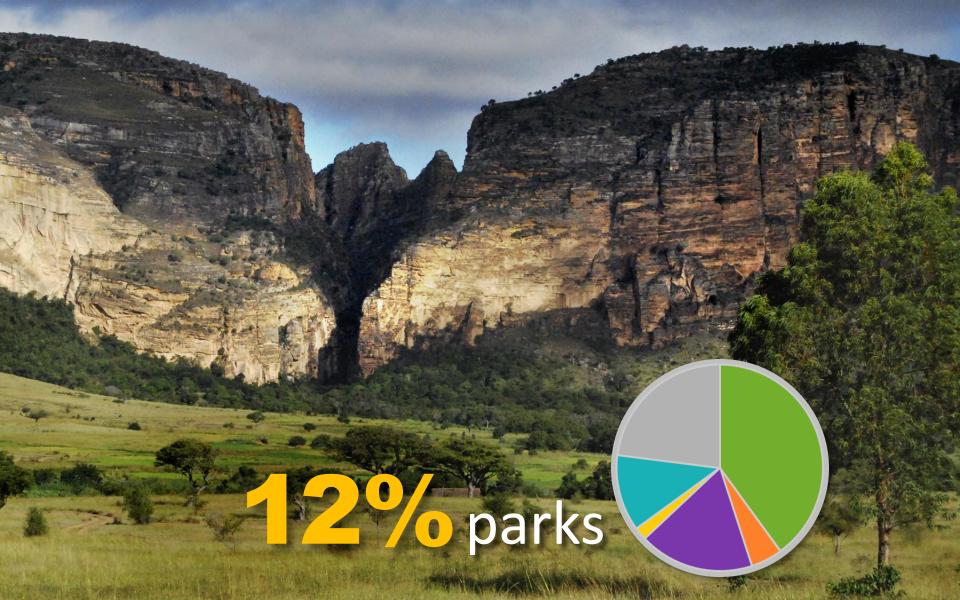








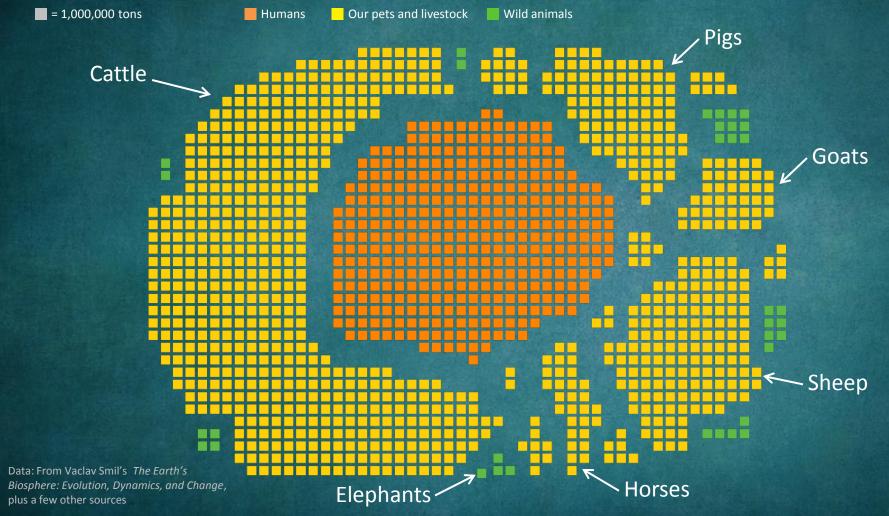








Earth's land mammals by weight



freezze the footprint of food



or should

all choices
be more sustainable?

by 2050 double net food availability

productivity & efficiency and waste & consumption





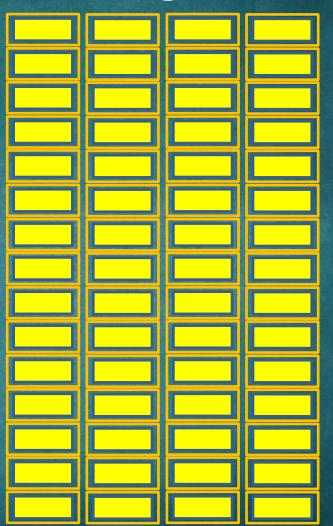
genetics

"dance with the one that brung you"

Sugar

Bananas





Corn

Orphan crops





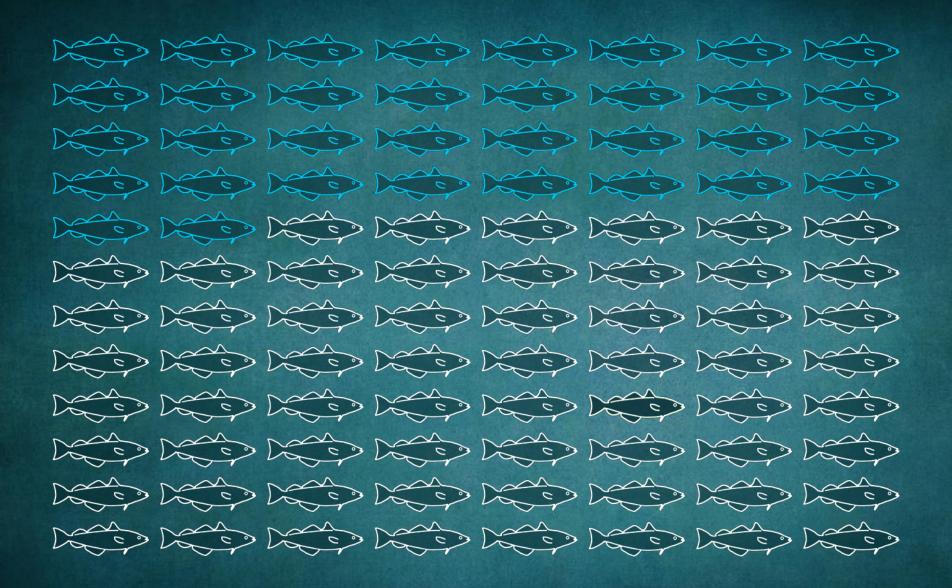
liter of water = calorie

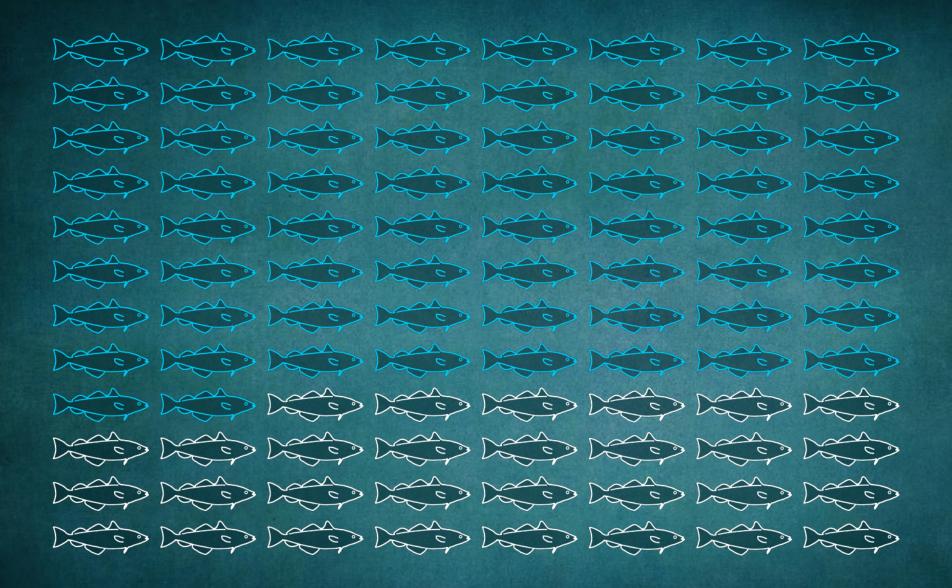
Poultry – efficiency matters

Chicken – improvement evolution

	以图画的是1700年的,此刻1700年的日本,1700年的1700年					
	1925	1945	1965	1985	2005	2045*
Conversion – kg feed/kg live	4.7	4.0	2.4	2.0	1.7	1.6
Mortality %	18%	10%	6%	5%	4%	3%
Age (days)	112	84	63	49	42	40
Live commercial weight - kg	1.0	1.4	1.6	1.9	2.4	3.2

*projected





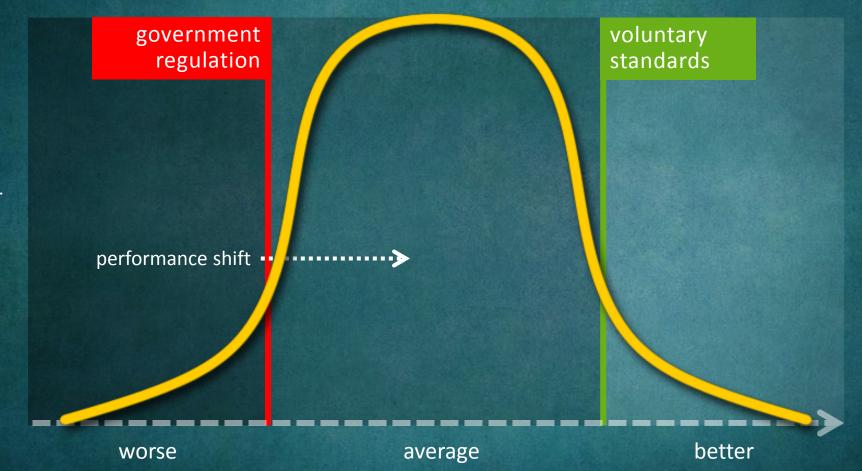


better practices 100 times better

which gives us more food?

recognizing the best or moving the rest?







BCI Cotton, 2005-13

BCI Certified Cotton

- 680,000 producers
- 3.7% of global production

Impacts of Metric-based Standards

- 60% pesticide reduction
- 40% water use reduction
- 30% synthetic fertilizer use reduction
- 15-20% increase in income

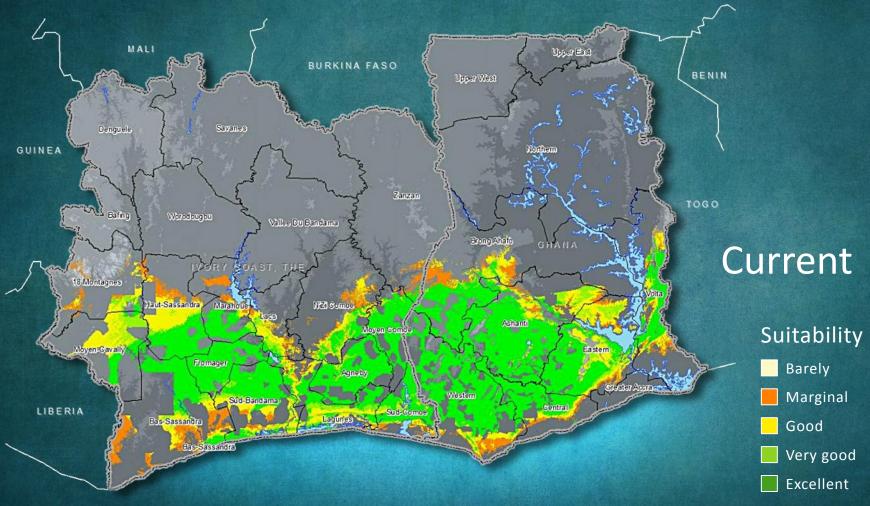




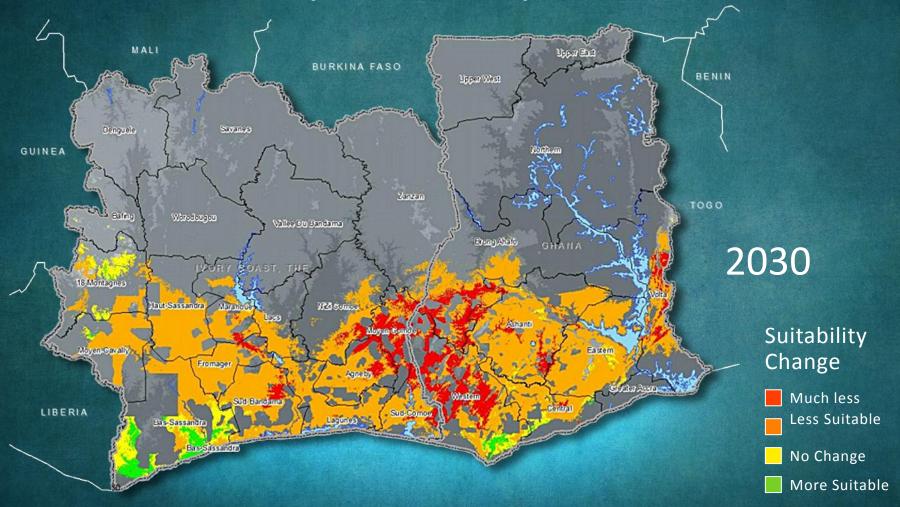
2012 US drought

- By 2013 soil moisture had not recovered
- Recharge with normal rains takes 2-3 years
- 2 years of drought in a row reduces recovery for 5-10 years
- Soil organic matter "burns"

Suitability of cocoa production



Suitability of cocoa production



in the short term climate smart agriculture = efficient production

in the medium term, producers change crops

who's moving sustainability from niche to norm?





























DELHAIZE #5 GROUP























Working with nature

Bord Bia Irish Food Board

the issue is



both availability and reputation

Components of S&P 500 market value

